Halliburton’s K-Max-Plus™ service provides a marked improvement over the already outstanding K-Max service you have come to rely upon for temporary control of fluid loss in your wells.

As a modification of K-Max technology, K-Max-Plus retains these key features:

- The unique chemistry that features completely reversible crosslinking.
- Rapid gel fluid removal by diffusion breaker mechanism.
- Complete freedom from the micro-fisheyes that are sometimes associated with HEC polymers and biopolymers.
- Its completely solids free system.
- A wide range of pill densities up to 13.8 lb/gal.
- A broad and diverse range of applications.

To these special features, K-Max-Plus service adds even more:

- Faster preparation of job-ready protection pills.
- Extended stability to temperatures up to 300°F.
- Greater gel strength to cope with higher differential pressures.

Exceptional fluid loss protection

Preventing costly completion fluids from leaking off into adjacent formations during well completion or recompletion operations is a high priority. Lost fluid is costly to replace and almost always causes some degree of permanent formation damage.

Operators can usually anticipate fluid loss problems and make plans to cope with them. K-Max-Plus service can be a valuable element in that plan. If a well trip is required prior to gravel packing, the operator will certainly need fluid loss protection. Also, after the screen is in place, more fluid could be lost while tripping the service tool out of the well. K-Max-Plus service can serve effectively in both applications.

But some fluid loss problems can develop quickly and unexpectedly. That’s why it is so important to have a fast acting, reliable fluid loss control capability available. K-Max-Plus service answers that need. It provides even faster and more reliable hydration and gel preparation than before.

Solids-free, non-damaging gel formulation

Good well workovers and completions require chemicals that do not damage the formation. This includes chemicals that are used for control of fluid losses. K-Max-Plus service retains the nondamaging properties that customers have come to rely upon in K-Max service. It continues to offer a solids-free, non-damaging temporary blocking gel that not only provides fluid loss control, but also can serve to control wellbore sloughing in open holes.

K-Max-Plus polymer is still supplied as an LGC (liquid gel concentrate) that can be hydrated in standard completion brines—based on salts of sodium, potassium, and calcium—up to 14.0 lb/gal density.

Broader temperature stability

Because the polymer in K-Max-Plus is now more thoroughly hydratable and crosslinkable, its stability at temperatures of 250°F to 300°F is improved. Lab tests have demonstrated K-Max-Plus gel can be stable for up to 72 hr at 300°F. As the K-Max-Plus gel is pumped downhole, the increasingly hotter temperatures cause it to become more densely crosslinked, therefore tougher. Yet, it still allows logging tools, screens, and pipe to be run through it while maintaining its seal against the formation. This feature can also help to guard against sloughing from weak formations and help keep unstable holes open.
Simple, effective chemical removal

K-Max-Plus gel can be thoroughly removed in a couple of simple steps. First, since K-Max-Plus gel effectively controls fluid loss without penetrating the formation, the majority of the gel pill can be circulated out of the fluid loss zone. It can even be reversed through a gravel pack screen. Next, an external acid breaker fluid can be spotted across the remnants of the pill. This changes the pH of the gel, thereby uncrosslinking the polymer and reverting it back to the consistency of brine. The K-Max-Plus polymer has been shown in special cases to break back efficiently in the presence of specific organic acid blends. This is a plus for HCl-sensitive formations.

In situations where overflushing with external breaker solutions is not practical, internal chemical breakers provide a variety of protection times across a wide span of temperatures.

Expanded versatility

The special features of K-Max-Plus service can be applied to a wide variety of well conditions and operators' challenges, beyond its primary fluid loss control application. For example, consider K-Max-Plus service in these situations:

• To help support poorly consolidated formations.
• To isolate zones for temporary diverting during stimulation.
• For use as an annulus protection fluid.
• For certain water shut-off applications.
• To prevent zonal communication.
• For use as a cuttings bridge during milling operations

Environmentally safe

K-Max-Plus chemistry is truly unique. Reversible crosslinking is accomplished without the use of environmentally offensive heavy metal compounds. And its HEC polymer backbone has been accepted for many years for use in environmentally sensitive areas. In fact, all of the components in K-Max Plus are considered to be extremely low in toxicity.